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# THE ACCS COMMON SOFTWARE PROGRAM

## SPC-93110-CMC

## VERSION 01.00.00

## SEPTEMBER 1993

**RANDY KORICH**

DTIC QUALITY INSPECTED 2

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This document accompanies a videotape of the same presentation recorded live at the Software Productivity Consortium in August 1993. It is recommended that the videotape be viewed with these viewgraphs at hand.

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RANDY KORICH

# ARMY COMMAND AND CONTROL SYSTEM (ACCS) COMMON SOFTWARE PROGRAM

## *THE ACCS COMMON SOFTWARE PROGRAM*

## ABSTRACT

In this video, Mr. Korich describes the current organization of the overall ACCS Program. He also discusses the common architecture and other technical considerations supporting reuse, and lessons learned both organizationally and technically. Mr. Korich describes how the ACCS Program will support significant planned software reuse in the development of multiple command and control systems for the Army. Many of these issues are being worked in the Consortium's Reuse Maturity Division.

# THE
# ARMY COMMAND AND CONTROL SYSTEM
# COMMON SOFTWARE PROGRAM

## Software Productivity Consortium

## 26 August 1993


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ACCS COMMON SOFTWARE PROGRAM

# OUTLINE

ACCS Common SW Architecture

Management Structure

Documentation

CASS Components

Common Applications

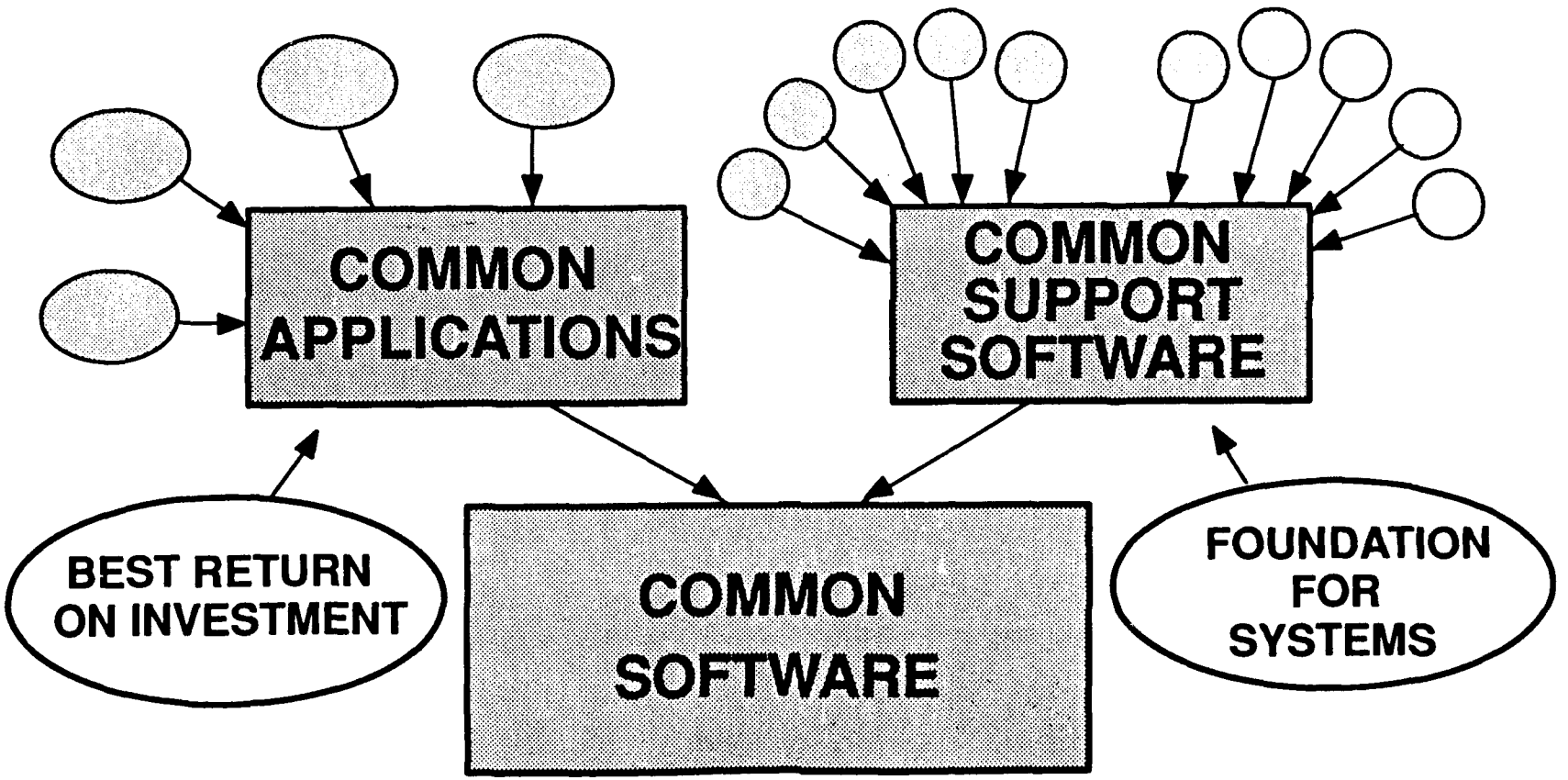
Lessons Learned

Summary

# ACCS COMMON SOFTWARE PROGRAM

**A major software reuse initiative that consists of two projects:**

- **Common ACCS Support Software (CASS)**
- **Common Applications (CA)**



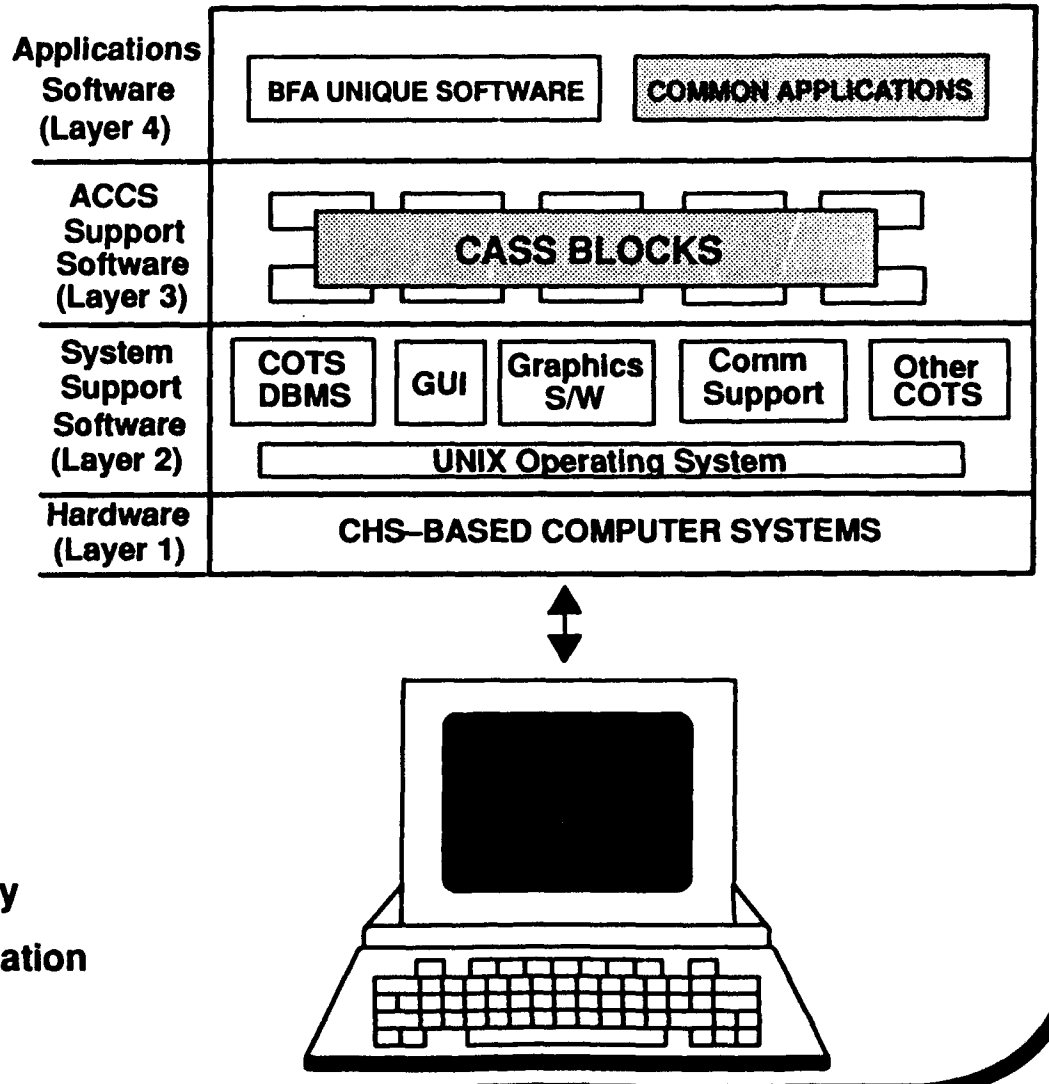
# ESTABLISHED FOUR–LAYER ARCHITECTURE FOR COMMON SOFTWARE

## STANDARDIZATION

- Structure
- Code Dev. Procedures
- Reuse Guidelines
- Module Interactions

## BENEFITS

- Reduce Development Costs
- Increase HW Independence
- Facilitate Expansion
- Improve Interoperability
- Reduce Sustainment Costs
- Provide Operational Flexibility
- Allow Wider Industry Participation



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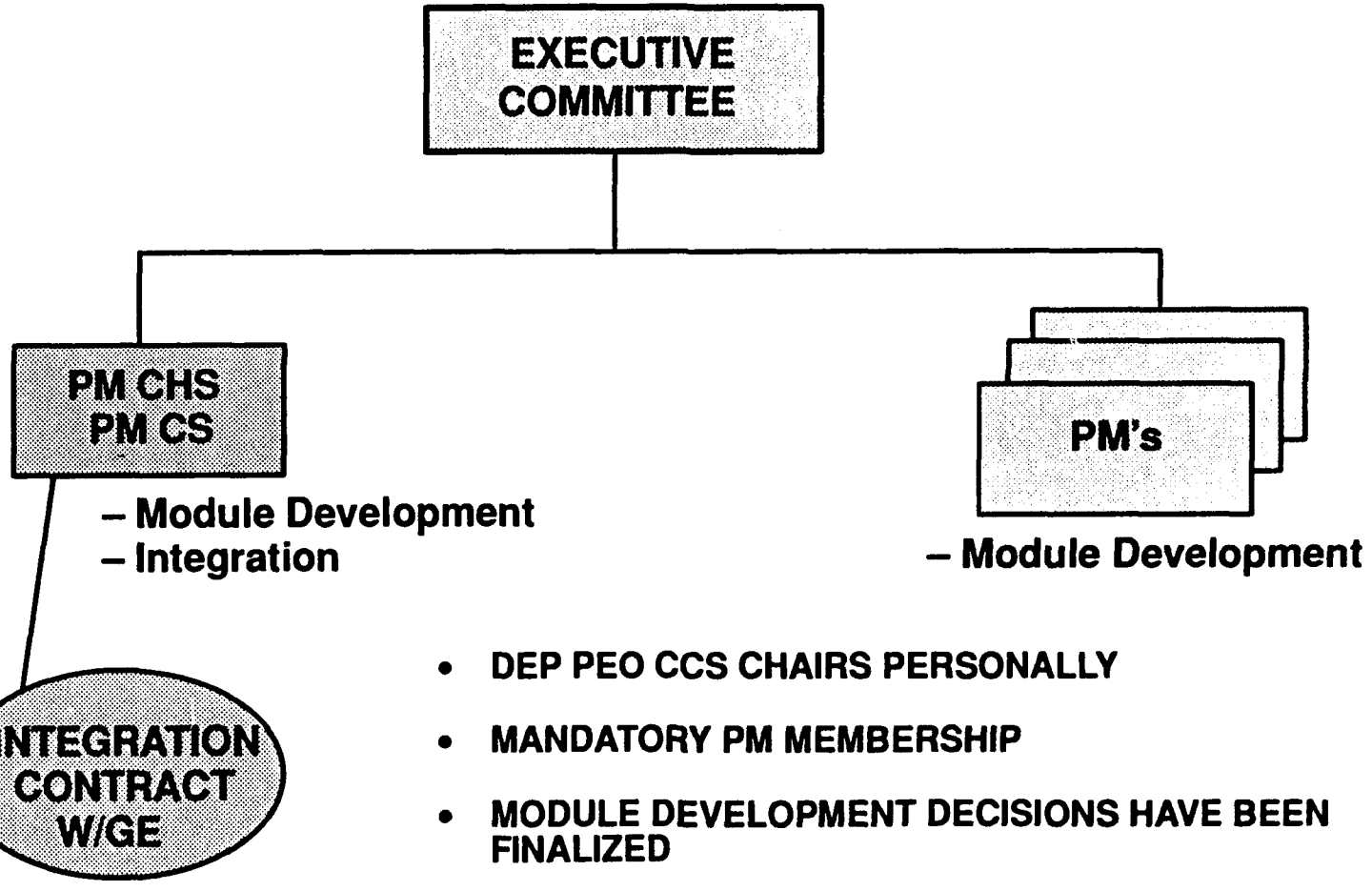
# MANAGEMENT STRUCTURE




- DEP PEO CCS CHAIRS PERSONALLY
- MANDATORY PM MEMBERSHIP
- MODULE DEVELOPMENT DECISIONS HAVE BEEN FINALIZED

## ACCS COMMON SOFTWARE PROGRAM

# DOCUMENTATION

**SYSTEM/SEGMENT SPEC (SSS) – 22Jul92**

CASS Requirements

**ARCH DESCRIPTION & OPN'L CONCEPT (ADOC) – 5Feb92**

Reuse Concepts
OOA Methodology

**SYSTEM/SEGMENT DESIGN DOCUMENT (SSDD) – 5Jun92**

Top Level Architecture
Interfaces
Testing Scenerios

VERY DIFFICULT TO OBTAIN AGREEMENT !!

**INTER–SOFTWARE COMM (ISC) RQMTS – 5Nov91**

Comm Services Rqmts

**ACCS S/W STAND & PRAC MAN (SSPM) – 31Mar92**

Software Standards and Guidelines

**PROD MGMT PLAN (PMP) – 18Jan93**

CS Management Structure
Roles & Responsibilities
CS Major Activities

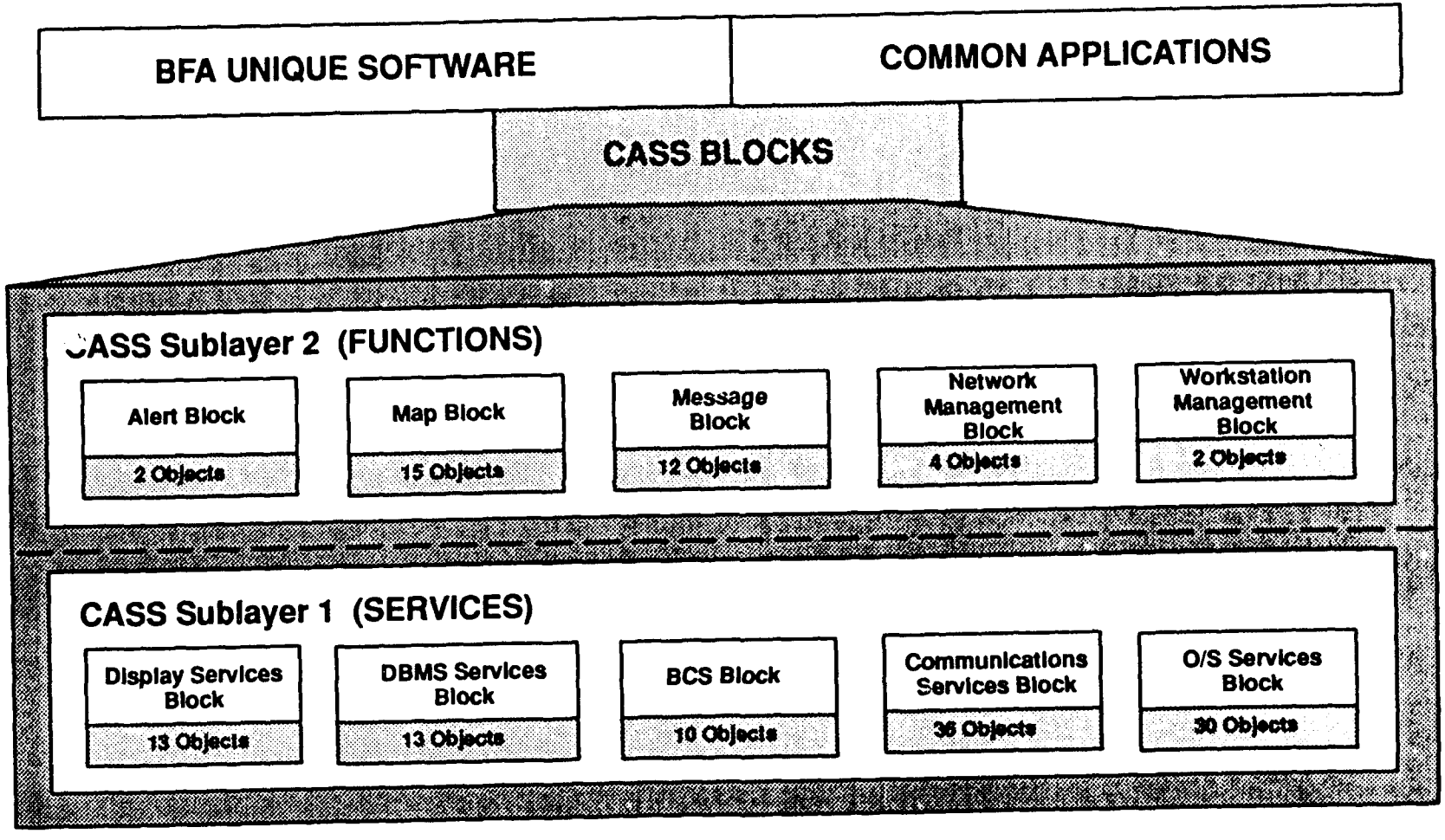
PRODUCT MANAGER – COMMON SOFTWARE

# COMMON ACCS SUPPORT SOFTWARE

# (CASS)

PRODUCT MANAGER – COMMON SOFTWARE

# CASS COMPONENT BREAKOUT




**SUMMARY: 10 Blocks**
**137 Objects**

# CASS SUBLAYER 1 FUNCTIONALITY

**DBMS SERVICES**

Performs database distribution and replication

Interfaces the C2 applications to the CHS DBMS

**COMMUNICATIONS**

Supports communications between systems on a LAN or WAN

Configures, monitors, and statuses the LAN or WAN hardware interfaces

**BASIC COMM SERVICES**

Supports the transparent communication between software units across the network

***CASS Sublayer 1 provides the interface to COTS S/W and H/W***

**DISPLAY SERVICES**

Provides lower level objects for controlling the interactive display using X-Windows/Motif

Controls and manages display objects, menus, and windows

**O/S SERVICES**

Interfaces C2 application to the UNIX operating system

Provides file, library security, and diagnostic services

# CASS SUBLAYER 2 FUNCTIONALITY

**MESSAGE**

Supports all ACCS required message formats

Provides services for message receipt interpretation, routing, and formulation

**MAP**

Generates, displays, and updates map data

**ALERT**

Captures, queues, processes, and displays audio/visual alerts

***CASS Sublayer 2 provides the support S/W interface to applications***

**WORKSTATION MGMT**

Manages and controls workstation functions including the configuration parameters

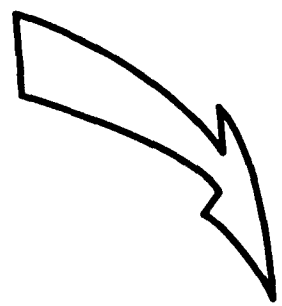
**NETWORK MGMT**

Manages and configures network-related parameters

ACCS COMMON SOFTWARE PROGRAM

# CASS ISSUE

- OBJECTIVE: Provide functionality required by the SSS, in an architecture consistent with the ADOC and SSDD; and maintain all block interfaces under Configuration Management
- PROBLEM: PEO CCS programs have made a significant investment in development of software that may meet CASS functional requirements but not the architecture
- SOLUTION: Two–phased approach



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# SOLUTION

- Common Software Evaluation Team chartered by PEO CCS in May 1992.
- The Team visited each BFA in order to facilitate the implementation of CASS based on the following goals:
  - Determine the suitability of current BFA software implementations for inclusion in near–term CASS
  - Identify specific differences between current BFA implementation architectures and CASS architecture as defined in the 14Feb92 System/Segment Design Document (SSDD)
  - Evaluate BFAs design for modularity and overall system engineering design approach
  - Recommend best candidates for CASS blocks.

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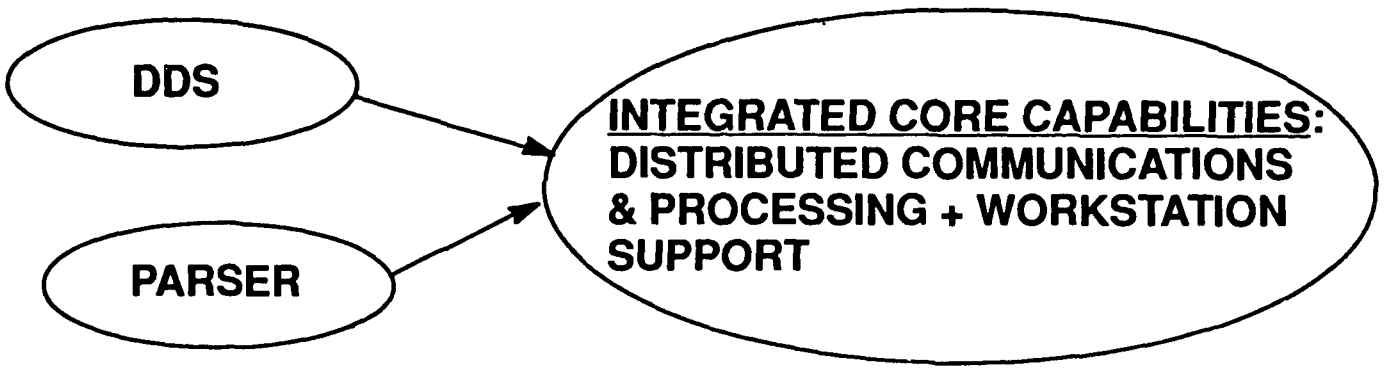
# SOLUTION (Continued)

- Integrate existing software IAW the ADOC and SSDD blocks
- Block developers provide CASS Programmer's Manuals IAW the SSPM
- Maintain Ada specs under PM CS configuration management and coordinate changes
- Update the SSDD to reflect changes in the models
- Scrub the SSS
- Grow functionality to meet the SSS requirements
- Coordinate a phased, incremental implementation corresponding to prioritized requirements
- Establish Technical Advisory Groups as required
- Utilize BFA's documentation to maximum extent possible

ACCS COMMON SOFTWARE PROGRAM

# PM CS INTEGRATION ACTIVITIES




- COORDINATE INTERFACES BETWEEN COMMON S/W PROVIDERS
- EVOLVE INTERFACES TO OPTIMIZE COMMON S/W USEABILITY
- INTEGRATE PRODUCTS FROM DIFFERENT COMMON S/W DEVELOPERS
- PERFORM INDEPENDENT ACCS THREAD TESTS TO VALIDATE IMPLEMENTATION OF DIFFERENT USERS' REQUIREMENTS
- PROVIDE PRIMARY INTERFACE BETWEEN COMMON SOFTWARE USER AND DEVELOPMENT COMMUNITIES

# COMMON APPLICATIONS

**The real pay–off for PEO CCS !!**

ACCS COMMON SOFTWARE PROGRAM

# COMMON APPS OVERVIEW

**PURPOSE:** APPLICATION SOFTWARE MODULES THAT PROVIDE FUNCTIONALITY TO MEET TODAY'S C2 REQUIREMENTS

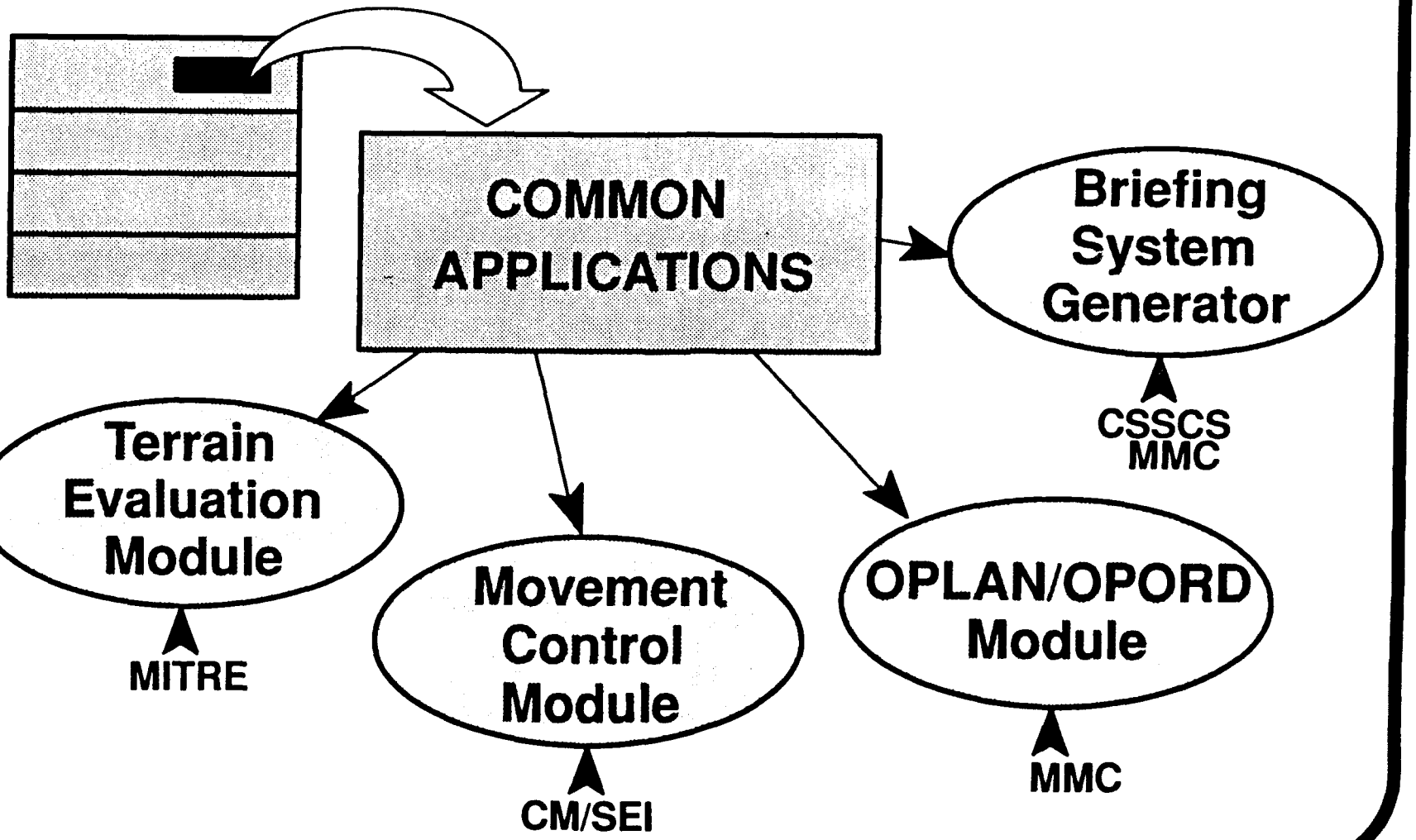
**KEY CHARACTERISTICS:**

- STAND–ALONE AND/OR INTEGRATED MODULES
- BASED ON ACCS LAYERED ARCHITECTURE
- UTILIZE SERVICES PROVIDED BY CASS
- FOCUS ON HIGH PAY–OFF AREAS
- CONCENTRATE ON APPLICATIONS AND NOT SUPPORT SOFTWARE

**DEVELOPMENT HAS BEGUN !**

ACCS COMMON SOFTWARE PROGRAM

# CA BEING DEVELOPED




PRODUCT MANAGER – COMMON SOFTWARE

ACCS COMMON SOFTWARE PROGRAM

# PROGRAMMATIC LESSONS LEARNED

- Provide strong management leadership
- Assign a strong independent project manager
  - Exercise independent project control
  - Incorporate user input
  - Feedback to all user levels
- Use the right people
- Focus on technical issues
- Obtain budgetary and programmatic support from the top of the organization and independent from the users
- Schedule the development of reusable assets before the users are under significant pressure from their development schedules

## ACCS COMMON SOFTWARE PROGRAM

# TECHNICAL LESSONS LEARNED

- Focus on technical issues instead of budget budgetary and programmatic issues
- Work by consensus
- Develop the requirements documents from scratch in working groups with technical representatives of all major users/developers

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# REUSE LESSONS LEARNED

- Recognize schedule risk when depending on planned products from other developers
- Rigorous product evaluations essential
  - Eliminate immature products
  - Reduce integration risks
  - Ensure key evaluation criteria met
- Require access to a technical staff to answer questions about a candidate product
- The extent and quality of the documentation of products to be ported has a significant impact on the cost of each release

ACCS COMMON SOFTWARE PROGRAM

# SUMMARY

- PROVIDES THE INFRASTRUCTURE AND FOCUSES FUTURE DEVELOPMENT EFFORTS ON APPLICATIONS
- FACILITATES ACCS PORTING TO LCU AND CHS–2 PLATFORMS
- IMPROVES INTEROPERABILITY WITHIN ACCS AND JOINT COMMUNITY
- SOFTWARE & DOCUMENTATION AVAILABLE TO SUPPORT BFA RECOMPETE EFFORTS
- REDUCES SOFTWARE TECHNICAL RISK
- SUPPORTS DoD REUSE INITIATIVES BY BEING PROCESS DRIVEN AND ARCHITECTURE CENTRIC

ACCS COMMON SOFTWARE PROGRAM

# SUMMARY

- Common Software requires commitment from total organization, must be top down driven
- Must be willing to pay upfront costs to save money in long term
- Requires formal documentation (SSS, ADOC, SSDD, etc.) to implement. Difficult process to get agreement from multiple PMs and contractors
- Process must permit trade–offs and central decisions when required
- Common Software will increase opportunities for industry to provide "stand–alone" modules

*Questions or comments on content should be directed to:*

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